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UNITED STATES PATENT AND TRADEMARK OFFICE

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10/051,339	01/18/2002	Santosh C. Lolayekar	MARA-01006US0 SBS	6530

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EXAMINER
LIN, WEN TAI

ART UNIT	PAPER NUMBER
2154	

DATE MAILED: 08/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *7/5/06*.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1,3-25 and 27-44* is/are pending in the application.
   4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) *1,3-25 and 27-44* is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All   b) ☐ Some * c) ☐ None of:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. _____.
    3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1, 3-25 and 27-44 are presented for examination.

2.   The examination/prosecution is reopened because a better secondary prior art (Connor and Elesson) is found. Due to the new ground of rejections, the finality of the previous office action is withdrawn.

3.   The text of those sections of Title 35, USC code not included in this action can be found in the previous office action.

4.   Claims 7, 16, 23, 29, 32, 34 and 38 are objected to for being unclear about the meaning of "measuring an actual bandwidth ... by a number of requests per second times an average size of requests". Specifically, the phrase "measuring an actual bandwidth" implies that the measurement is performed in real time. However, the disclosed method "by a number of requests per second times an average size of requests" is actually an estimate of the bandwidth over the averaging period. Furthermore, it appears that the so obtained bandwidth is solely relied upon the one-way traffic from the initiator to the content provider because the phrase "average size of requests" is understood as an average size (in terms of number of packets) in the request messages. For prior art rejection in this office action, the phrase "measuring an

actual bandwidth" is construed as "estimating the bandwidth associated with the request

messages". Clarification is required in response to this office action.

Claim Rejections - 35 USC § 102

5.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by
another filed in the United States before the invention by the applicant for patent or (2) a patent
granted on an application for patent by another filed in the United States before the invention by the
applicant for patent, except that an international application filed under the treaty defined in section
351(a) shall have the effects for purposes of this subsection of an application filed in the United States
only if the international application designated the United States and was published under Article 21(2)
of such treaty in the English language.

6.   Claims 1, 3-4, 25, 27, 33 and 35-36 are rejected under 35 U.S.C. 102(e) as being

anticipated by Guha et al.[U.S. 20020194324].

7.   As to claim 1, Guha teaches the invention as claimed including: a method for

use in a storage network, the storage network including at least one initiator [e.g., 5,

Fig.1], at least one storage device and a storage switch [e.g., LIC of Fig.1, wherein the

LIC including a storage subsystem and a storage switch] in communication with the at

least one initiator and the at least one storage device, the method comprising:

providing, by the storage switch, quality of service to the at least one initiator for

accessing the at least one storage device in the storage network [paragraphs 40-45;

note that it is clear by comparing the elements in Figs. 1 and 4, the storage switch (i.e.,

LIC of Fig.1 less the servers and storage subsystem) provides the functionalities of 36,

34, 38 and 42 of Fig.4].

8.   As to claims 3-4, Guha further teaches that the step of providing quality of

service includes controlling the number of packets, or the number of requests, from the

at least one initiator to the at least one storage device during a period of time [e.g.,

paragraphs 19 and 25; note that "controlling the number of packets ... during a period of

time" is mapped to the feature of "updating a content request traffic profile" in Guha's

content controller, wherein the number of packets and the number of requests are

equivalent because each request constitutes a packet].

9.   As to claim 25, Guha teaches the invention as claimed including: a switch for

use in a storage network [e.g., Fig.4; paragraph 63], the switch comprising:

        a port [e.g., any port of the SAN switch] to be coupled to an external device,

wherein the external device includes at least one of an initiator and a storage device

[e.g., 39-40 and 42, Fig.4 are external devices when functional blocks 34, 36, 38 and 42

of Fig. 4 are included in the switch]; and

        a bandwidth controller [e.g., 36, Fig.4], the bandwidth controller including a

processor, a traffic manager, and a buffer [paragraphs 73-74; note that Guha teaches

using a computer to implement the steps outline din Fig.8, wherein the content

controller functions as a bandwidth controller. Being a computer, it is inherent that there

must be a processor, a traffic manager program for performing the steps of Fig.8, and a

buffer for holding temporary data].

10.   As to claim 27, Guha further teaches that the processor is a storage processor

[since the processor involves management of the SAN storage devices, it may be called

a storage processor].

11.   As to claim 33, Guha teaches the invention as claimed including: a storage

switch for use in a storage network comprising:

        a first port to be coupled to at least one initiator [e.g., the port of the SAN switch

in 1 of Fig.1 connected to 5 of Fig.1];

        a second port to be coupled to at least one storage device [e.g., another port of

the SAN switch connected to any of the storage device in Fig. 1; see also Fig.4 for

details]; and

        means for providing quality of service for a connection from the at least one

initiator to the at least one storage device in the storage network [e.g., paragraphs 67-

68].

12.   As to claims 35-36, since the features of these claims can also be found in claims

25, 27 and 33, they are rejected for the same reasons set forth in the rejection of claims

25, 27 and 33 above.

Claim Rejections - 35 USC § 103

13.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

14.   Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guha et

al.(hereafter "Guha")[U.S. 20020194324], as applied to claims 1, 3-4, 25, 27 and 33

above, further in view of Connor [U.S. PGPub. 20020087714].

15.   As to claim 5, Guha does not specifically teach that the step of providing quality

of service includes adjusting a number of concurrent requests allowed to be sent by the

at least one initiator.

However, in the same field of endeavor Connor teaches a client-side throttling

method for limiting the number of concurrent requests to be sent to the content server

[paragraph 33].

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to adopt Connor's method in Guha's system as a measure for

controlling the requests arriving at the content servers because throttling at the client

side is a more effective effort without having to drop a client's requests when the system could not handle all the concurrent content requests [for motivations see, e.g., Guha: paragraphs 4-6, 9 and Connor: paragraph 34].

16.   Claims 6-8, 16-21, 29, 34 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guha et al.(hereafter "Guha")[U.S. 20020194324], as applied to claims 1, 3-5, 25, 27 and 33 above and Connor [U.S. PGPub. 20020087714], as applied to claim 5 above, further in view of Elesson et al.(hereafter "Elesson")[U.S. 6459682].

17.   As to claim 6, Guha teaches that the step of providing quality of service includes implementing a service level agreement (SLA) by applying QoS rules according to the observed traffic [paragraph 20].

Guha and Connor does not specifically teach teach adjusting the number of requests allowed the at least one initiator to keep the bandwidth utilized by the at least one initiator within a specified range.

However, Elesson teaches a QoS policy to maintain the bandwidth utilization of each client (according to the SLA) by regulating congested traffic channels to within specified bounds via, e.g., access control [col.1, lines 49-52; col.5 line 48- col.6 line 26].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Elesson's QoS rules to Guha and Connor's content service system by throttling each user's request such that the SLA-allowed bandwidth utilization can be controlled within a specified range (according to the SLA) because network

bandwidth is a well known parameter characterizing network traffic and by adjusting the number of requests submitting from the client side, it could avoid dropping overflowed packets and results more efficient use of the network resources [Guha: paragraph 68].

18.   As to claim 7, Guha, Connor and Elesson further teach the step of providing quality of service includes:

guaranteeing a minimum bandwidth to the at least one initiator to access the storage device [Elesson: col.5 lines 48-54, wherein the "guaranteeing a minimum bandwidth" is mapped to keeping the traffic flow to within specified bounds – i.e., the lower bound being a guaranteed minimum traffic or bandwidth];

measuring an actual bandwidth utilized by the initiator, where the actual bandwidth is measured by a number of requests per second times an average size of requests from the at least one initiator [e.g., Elesson: claim 18; i.e., "monitoring traffic ... at each of a plurality of edge devices" can be accomplished by measuring the number of request times an average size of requests]; and

adjusting a number of concurrent requests allowed to be sent by the at least one initiator [Connor: paragraph 33; see motivation for the combination of Guha, Connor and Elesson in the rejection of claims 5-6 above].

19.   As to claim 8, Guha, Connor and Elesson further teach :

guaranteeing up to a maximum bandwidth to the at least one initiator to access the at least one storage device [Elesson: col.5 lines 48-54, wherein the "guaranteeing a

maximum bandwidth" is mapped to keeping the traffic flow to within specified bounds –

i.e., the upper bound being a guaranteed maximum traffic or bandwidth];

wherein adjusting the number of concurrent requests includes reducing the

number of concurrent requests allowed by the at least one initiator when the actual

bandwidth exceeds the maximum bandwidth Connor: paragraph 33; note that Connor's

throttling process includes reducing/increasing the number of concurrent requests

allowed by the at least one initiator when the actual bandwidth exceeds/falls below the

maximum/minimum bandwidth or traffic].

20.   As to claim 16, since the features of this claim can also be found in claims 9, it is

rejected for the same reasons set forth in the rejection of claims 9 above.

21.   As to claim 20, Guha further teaches that the targets are virtual targets

[paragraph 60; i.e., the virtual storages].

22.   As to claims 17-19, 21, 29, 34 and 37, since the features of these claims can

also be found in claims 1, 7-9, 13-16, 25 and 33, they are rejected for the same reasons

set forth in the rejection of claims 1, 7-9, 13-16, 25 and 33 above.

23.   Claims 9, 15 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Guha et al.(hereafter "Guha")[U.S. 20020194324], as applied to claims 1, 3-8, 16-

21, 25, 27, 29, 33-34 and 37 above, and further in view of Elesson et al.(hereafter

"Elesson")[U.S. 6459682], as applied to claims 6-8, 16-21, 29, 34 and 37 above.

24.   As to claim 9, Guha teaches the invention substantially as claimed including: a

method for use in a storage network, the storage network including at least one initiator,

at least one storage device, and at least one storage switch, wherein the at least one

initiator and the at least one storage device are both in communication with the storage

switch [e.g., LIC of Fig.1; paragraphs 40-45, wherein the LIC including a storage

subsystem and a storage switch], the method comprising:

   guaranteeing, by the storage switch, a minimum bandwidth to the at least one

initiator to access the at least one storage device in the storage network [Elesson:

col.1, lines 49-52; col.5 line 48- col.6 line 26]; and

   measuring, by the storage switch [i.e., the egress device in Elesson's system], an

actual bandwidth utilized by the at least one initiator, where the actual bandwidth is

measured by a number of requests per second times an average size of requests from

the at least one initiator [e.g., Elesson: claim 18; i.e., "monitoring traffic ... at each of a

plurality of edge devices" can be accomplished by measuring the number of request

times an average size of requests].

   [See motivation for the combination of Guha and Elesson in the rejection of claim

6 above].

25.   As to claim 15, Guha and Elesson does not specifically teach that measuring the

actual bandwidth includes determining if a buffer includes a number of packets beyond

a specified threshold.

However, Elesson teaches that when traffic belonging to certain service-level is

found to be in violation of an assigned traffic rate (e.g., bandwidth usage beyond

allocated level), corresponding actions would be dropping packets, buffering packets, or

downgrading packets to a different service-level, etc [col.8 lines 40-58].

Thus, it would have been obvious to one of ordinary skill in the art to realize that

when the buffered packets keep coming, a threshold must be set up to consider further

actions (such as dropping the incoming packets or downgrading packets to a different

service level) if the buffered packets reach to the threshold because buffers are limited

in size and a threshold is required to avoid packets from overflowing the buffer.

26.   As to claim 30, since the features of this claim can also be found in claims 9 and

15, it is rejected for the same reasons set forth in the rejection of claims 9 and 15

above.

27.   Claims 10-14, 22-24, 31-32 and 38-44 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Guha et al.(hereafter "Guha")[U.S. 20020194324], as applied

to claims 1, 3-9, 15-21, 25, 27, 29-30, 33-34 and 37 above and Elesson et al.(hereafter

"Elesson")[U.S. 6459682], as applied to claims 6-9, 15-21, 29-30, 34 and 37 above, and

further in view of Connor [U.S. PGPub. 20020087714], as applied to claims 5-8, 16-21,

29, 34 and 37 above.

28.   As to claims 10-14, 22-24, 31-32 and 38-44, since the features of these claims

can also be found in claims 1, 5-9, 16-17, 25 and 29-30, they are rejected for the same

reasons set forth in the rejection of claims 1, 5-9, 16-17, 25 and 29-30 above.

29.   Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guha et

al.(hereafter "Guha")[U.S. 20020194324], as applied to claims 1, 3-25, 27, 29-34 and

37-44 above.

30.   As to claim 28, Guha does not specifically teach that the port and the bandwidth

controller are on one of a plurality of linecards in the switch, wherein each linecard

includes a respective port and a respective bandwidth controller.

It would have been obvious to one of ordinary skill in the art that a wide variety of network management

subsystems can be implemented on linecards.

It would have been obvious to one of ordinary skill in the art at the time the

invention was made that Guha's bandwidth controller may also be implemented on a

linecard because this form of implementation makes it rather easy to expand or upgrade

the functionalities of the controller.

31.   A shortened statutory period for response to this action is set to expire 3 (three)

months and 0 days from the mail date of this letter. Failure to respond within the period

for response will result in ABANDONMENT of the application (see 35 U.S.C. 133,

M.P.E.P. 710.02, 710.02(b)).

Conclusion

Examiner note: Examiner has cited particular columns and line numbers in the

references as applied to the claims above for the convenience of the applicant.

Although the specified citations are representative of the teachings of the art and are

applied to the specific limitations within the individual claim, other passages and figures

may apply as well. It is respectfully requested from the applicant in preparing

responses, to fully consider the references in entirety as potentially teaching all or part

of the claimed invention, as well as the contest of the passage as taught by the prior art

or disclosed by the Examiner.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Wen-Tai Lin whose telephone number is (571)272-3969.

The examiner can normally be reached on Monday-Friday(8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, John Follansbee can be reached on (571)272-3964. The fax phone

numbers for the organization where this application or proceeding is assigned are as

follows:

(571) 273-8300 for official communications; and

(571) 273-3969 for status inquires draft communication.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Wen-Tai Lin

August 20, 2006